Amendments to the Claims:

This listing of claims will replace all prior versions and listings of claims in the application.

Listing of Claims:

1. **(Currently amended)** An electronic device comprising:

~~(a)~~ a crystalline substrate;

~~(b)~~ an electrode formed on and epitaxial to the substrate, the electrode comprising a first superconductive oxide;

~~(c) an insulator formed on and epitaxial to the electrode;~~

~~(d)~~ a barrier comprising a non-superconducting, ion-modified ~~plasma-treated~~ surface layer of the first superconductive oxide; and

~~(e)~~ a counter-electrode formed directly on and epitaxial to the barrier, the counter-electrode comprising a second superconductive oxide, whereby a Josephson junction is formed between the electrode and the counter-electrode.

2. (Original) The device of claim 1, wherein the barrier is a surface formed by treating the first superconductive oxide with a plasma comprising a gas selected from the group consisting of argon, xenon, oxygen, and halogen.

3. (Original) The device of claim 2, wherein the gas is argon gas.

4. (Original) The device of claim 2, wherein the gas is a 1:1 mixture of argon and oxygen.

5. (Original) The device of claim 1 wherein the first superconductive oxide has an a-b plane and a step-edge junction is formed in the a-b plane of the first superconductive oxide.

6. (Original) The device of claim 1 wherein the first superconductive oxide has an a-b plane, the a-b plane is epitaxial to the substrate, and the second superconductive

oxide is on and epitaxial to the first superconductive element, whereby a junction is formed perpendicular to the a-b plane of the first superconductive oxide.

7. (Original) The device of any one of claims 1-6, wherein the first and second superconductive oxide is YBCO.

8. (Original) The device of claim 1, the device having an I_cR_n value of at least about 0.3 mV at a temperature of 4.2 K.

9. (Original) The device of claim 2, the device having an I_cR_n value of at least about 0.3 mV at a temperature of 4.2 K.

10. (Original) The device of claim 3, the device having an I_cR_n value of at least about 0.3 mV at a temperature of 4.2 K.

11. (Original) The device of claim 4, the device having an I_cR_n value of at least about 0.3 mV at a temperature of 4.2 K.

12. (Original) The device of claim 5, the device having an I_cR_n value of at least about 0.3 mV at a temperature of 4.2 K.

13. (Original) The device of claim 6, the device having an I_cR_n value of at least about 0.3 mV at a temperature of 4.2 K.

14. (Original) The device of claim 7, the device having an I_cR_n value of at least about 0.3 mV at a temperature of 4.2 K.

15. (Original) The device of claim 1, the device having an I_cR_n value of at least about 0.5 mV at a temperature of 40 K.

16. (Original) The device of claim 2, the device having an I_cR_n value of at least about 0.5 mV at a temperature of 40 K.

17. (Original) The device of claim 3, the device having an I_cR_n value of at least about 0.5 mV at a temperature of 40 K.

18. (Original) The device of claim 4, the device having an I_cR_n value of at least about 0.5 mV at a temperature of 40 K.

19. (Original) The device of claim 5, the device having an I_cR_n value of at least about 0.5 mV at a temperature of 40 K.

20. (Original) The device of claim 6, the device having an I_cR_n value of at least about 0.5 mV at a temperature of 40 K.

21. (Original) The device of claim 7, the device having an I_cR_n value of at least about 0.5 mV at a temperature of 40 K.

22. (Withdrawn) A process for making a Josephson junction device comprising the steps of:

(a) preparing a substrate;

(b) depositing an electrode comprising a first layer of a superconductive oxide on the substrate;

(c) depositing an insulating layer on the first layer of superconductive oxide;

(d) patterning to form a pre-device having an exposed surface of the first superconductive oxide;

(e) placing the pre-device into a deposition chamber;

(f) forming a barrier on the exposed surface of the first layer of superconductive oxide by treating the exposed surface with plasma; and

(g) depositing a second layer of a superconductive oxide on the pre-device, whereby a Josephson junction is formed between the first and the second superconductive oxides at the barrier.

23. (Withdrawn) The process of claim 22, wherein the treating is with a plasma of Ar gas at a pressure of between 10 and 100 mTorr.

24. (Withdrawn) The process of claim 22, wherein the treating is with a mixture of Ar and O_2 gas at a pressure of between 10 and 100 mTorr.

25. (Withdrawn) The process of any one of claims 22-24, further comprising the step of vacuum annealing the pre-device prior to depositing the second superconductive oxide.

26. (Withdrawn) A superconductor device, comprising:

a) an oxide superconductor having a surface exposed to ambient environment; and

b) a passivation layer covering at least a portion of the surface of the oxide superconductor that is exposed to the ambient environment.

27. (Withdrawn) The device claim 26, further comprising a buffer layer at least partially between the passivation layer and the oxide superconductor.

28. (Withdrawn) The device of claim 26, wherein the passivation layer originates from the superconductor.

29. (Withdrawn) The device of claim 28, wherein the passivation layer is an ion-modified layer of the superconductor.

30. (Withdrawn) The device of claim 26, wherein the oxide superconductor comprises $YBa_2Cu_3O_{7-\delta}$, wherein $\delta \geq 0$.

31. (Withdrawn) The device of claim 26, wherein the passivation layer is an electrical insulator.

32. (Withdrawn) The device of claim 26, wherein the passivation layer is epitaxial and crystalline.

33. (Withdrawn) The device of claim 26, wherein the passivation layers covers the entire surface of the oxide superconductor that is exposed to the ambient environment.

34. (Withdrawn) The device of claim 26, further comprising a layer of a superconductive oxide on the passivation layer, whereby a Josephson junction is formed between the superconductive oxides.

35. (Withdrawn) A method of providing a passivation layer on the surface of an oxide superconductor, the method comprising vacuum annealing and plasma treating at least a portion of the surface of the oxide superconductor that is exposed to ambient environment.

36. (Withdrawn) The method of claim 35, further comprising additional vacuum annealing after the plasma treatment.

37. (Withdrawn) The method of claim 35, further comprising heating in an oxygen-rich environment after the plasma treatment.

38. (Withdrawn) The method of claim 35, comprising vacuum annealing and plasma treating the entire surface of the oxide superconductor that is exposed to ambient environment

39. (Withdrawn) A method of making a superconductor device, the method comprising:

a) forming a layer of oxide superconductor on a substrate, the layer of oxide superconductor having a surface that is exposed to ambient environment; and

b) passivating at least a portion of the surface of the oxide superconductor that is exposed to ambient environment.

40. (Withdrawn) The method of claim 39, comprising passivating the entire exposed surface of the oxide superconductor.

41. (Withdrawn) The method of claim 39, wherein the passivating step comprises bombarding the exposed surface portion with ions.

42. (Withdrawn) The method of claim 41, further comprising annealing the layer of oxide superconductor between steps (a) and (b).

43. (Withdrawn) The method of claim 42, further comprising annealing the layer of oxide superconductor after step (b).

44. (Withdrawn) The method of claim 42, wherein the bombarding step comprises treating the exposed surface portion with plasma.

45. (Withdrawn) The method of claim 39, wherein step (a) comprises forming a layer of $YBa_2Cu_3O_{7-\delta}$, wherein $\delta \geq 0$.

46. (Withdrawn) The method of claim 42, further comprising heating the oxide superconductor in oxygen after step (b).

47. (Withdrawn) The method of claim 46, further comprising cooling the oxide superconductor to room temperature in oxygen after heating the oxide superconductor in oxygen.

48. (Withdrawn) The method of claim 41, further comprising maintaining the layer of oxide superconductor at a temperature of between about 300 °C and about 650 °C while bombarding the exposed surface portion with ions.

49. (Withdrawn) The method of claim 46, wherein the heating step comprises maintaining the layer of oxide superconductor at a temperature of between about 700 °C and about 800 °C after treating the exposed surface portion with plasma.

50. (Withdrawn) The method of claim 39, wherein the passivation step comprises changing a surface layer of the oxide superconductor to a material different from the oxide superconductor.

51. (Withdrawn) The method of claim 50, wherein the changing step comprises changing the surface layer of the oxide superconductor to a material having an oxygen mobility that is lower than the oxygen mobility in the oxide superconductor.

52. (Withdrawn) The method of claim 39, further comprising forming a layer of oxide superconductor on at least a portion of the passivated surface portion, whereby a Josephson junction is formed between the oxide superconductors.

53. (Withdrawn) A passivation layer comprising an ion-modified layer on an oxide superconductor, the ion-modified layer covering at least a portion of the surface of the oxide superconductor that would otherwise be exposed to ambient environment, and the ion-modified layer having an oxygen mobility that is lower than an oxygen mobility of the oxide superconductor.

54. (Withdrawn) The passivation layer of claim 53, wherein the ion-modified layer is formed by material originating from the oxide superconductor.

55. (Withdrawn) The passivation layer of claim 53, wherein the ion-modified layer is an externally applied layer that is bonded to the oxide superconductor.

56. (Withdrawn) The passivation layer of claim 55, wherein the ion-modified layer is quasi-cubic and is not $YBa_2Cu_3O_{7-\delta}$, wherein $\delta \geq 0$.

57. (Withdrawn) The passivation layer of claim 53, wherein the ion-modified layer is epitaxial and crystalline.

58. (Withdrawn) The passivation layer of claim 53, the ion-modified layer covering the entire surface of the oxide superconductor that would otherwise be exposed to ambient environment.

59. **(New)** A Josephson junction device, comprising:

a first layer comprising an oxide high-temperature superconductor;

a second layer comprising an oxide high-temperature superconductor; and

a third layer connecting the first and second layers and comprising a non-superconductor,

the first and third layers being formed from a starting oxide high-temperature superconductor layer of an oxide high-temperature superconductor, the third layer being an ion-modified portion of the starting oxide high-temperature superconductor layer, the first layer being an unmodified portion of the starting oxide high-temperature superconductor layer.

60. **(New)** The Josephson junction device of claim 59, wherein the first and second layers are epitaxial to each other, and wherein the third layer is formed on a ramp-edge of the first layer.

61. **(New)** The Josephson junction device of claim 60, further comprising a crystalline substrate supporting the first, second and third layers, wherein the first and second layers are epitaxial to the substrate.

62. **(New)** The Josephson junction device of claim 60, wherein the first layer comprises an YBCO superconducting oxide.

63. **(New)** A Josephson junction structure comprising:

a substrate; and

a plurality of Josephson junction devices of claim 1 formed on the substrate and having respective I_c values within about 7.8% of each other, and respective R_n values within about 3.5% of each other, at 4.2 K.

64. **(New)** The Josephson junction structure of claim 63, wherein the plurality of Josephson junctions comprise at least 10 Josephson junction devices of claim 1 and having respective I_c values within about 7.8% of each other, and respective R_n values within about 3.5% of each other, at 4.2 K.